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## Another Explosion.

On the 26th ult. a steam boiler employed at the balance dock, E. R., this city, exploded and by a most merciful providence no person was killed, although the explosion was terrific, and many persons were in the neighborhood at the time. A large piece of the boiler, weighing 1,200 lbs. was thrown several hundred feet from the place of explosion. There should be Inspectors appointed for stationary engine boilers as well as for those on steamboats. The great number of such explosions continually taking place, demand laws to prevent the murders—for we can call them nothing less—committed by reckless engineers and owners of boilers. The explosion of this boiler has been attributed to an insufficient supply of water.

STILL ANOTHER.—On the 28th ult., the boiler of the propeller *Union* exploded at New Castle, Md., the vessel rendered a wreck, the engineer and a fireman killed, and a number of others on board severely injured.

## Cattle and Whitewash.

A correspondent writing to us from Highland, Ill., states that a recipe published in our columns describing a good whitewash for fences, lasted only half a day with him. The whitewash was composed of lime and salt, and when his cattle came home, he says, "in the evening, from the prairie, they licked the fence-boards as clean as if whitewash had never been put on." This is a pretty good joke. Well, we did not give the whitewash recipe for the purpose of salting his cattle; the salt was recommended to be mixed with the lime for the purpose of keeping the latter from scaling off by dry winds. The recipe, however, must be a most excellent one, when the very cattle of the prairies are led by instinct to swallow it.

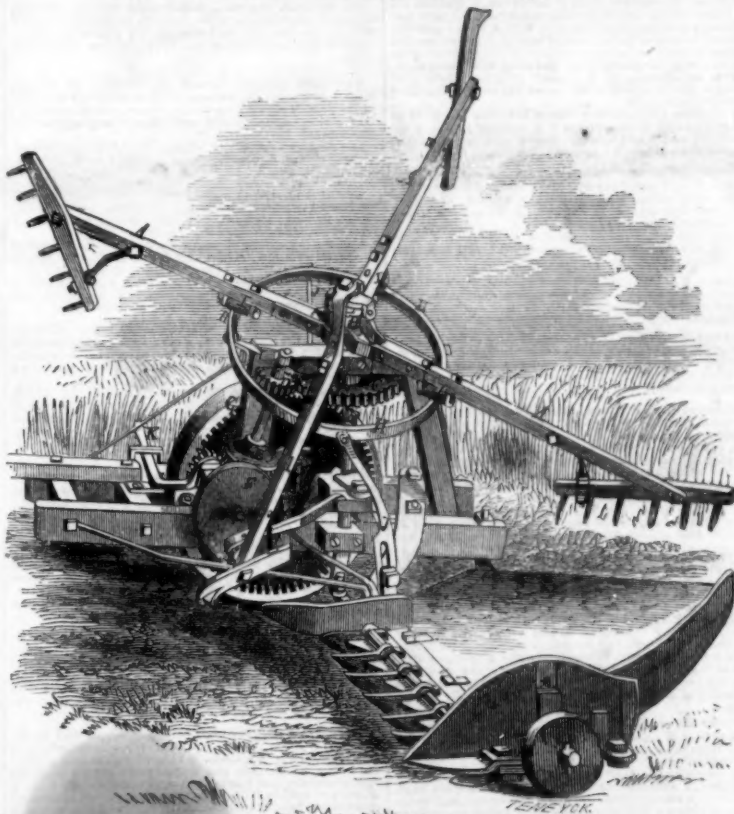
## Improved Harvester.

The invention illustrated in our engraving consists chiefly of an improved raking attachment, whereby the grain, as fast as it is cut, is swept from the platform of the machine and deposited in bundles on the ground, ready for binding.

Many of the raking apparatuses heretofore brought before the public have proved too frail, complicated, or otherwise inefficient. It is believed by the inventor that the present improvement is free from all impracticabilities.

The raking apparatus consists of four long arms, A, connected, by means of swivel joints, with the end of an upright shaft, B. Motion is given to this shaft by means of its cog wheel, C, which gears with pinion D, whose shaft has, at its lower end, another pinion, E, receiving its motion from driving pinion, F, which latter connects with the cogs on the inside of the driving wheel, G. H is a cam ring, on which the arms, A, rest as they roll, the friction rollers, I, bearing on the face of the ring. The latter is placed at an angle, and its edge is so arranged that the rakes, as they come around, sweep evenly across the top of the platform; the swivel joints of the raker arms, A, before mentioned, enable them to follow the contour of the ring, H. J J are adjustable braces, which permit the alteration

## IMPROVEMENT IN REAPING MACHINES.



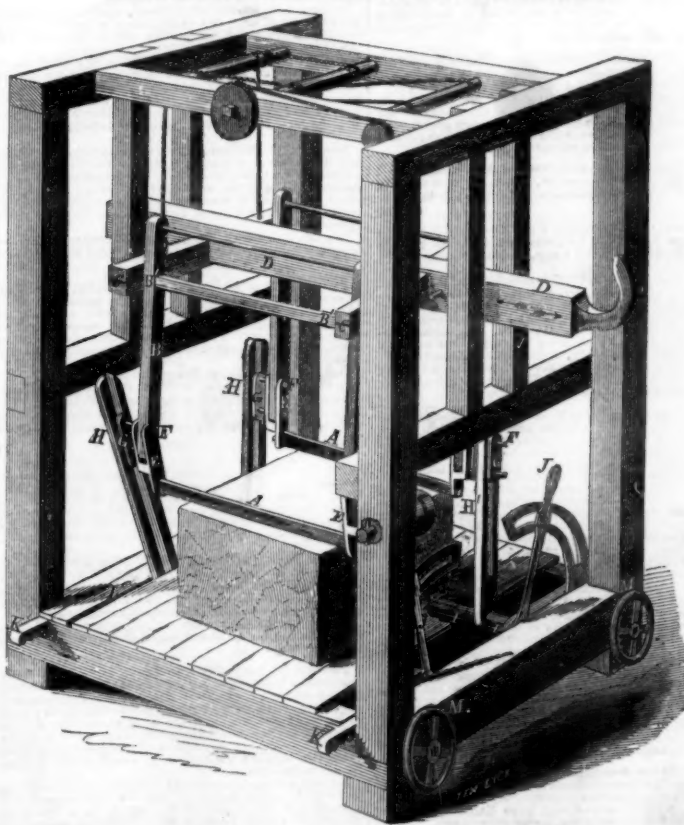
of the ring to any desired angle. K is a clutch lever, by moving which all the machine is thrown out of gear. The cutting arrangements are much the same as in ordinary harvesters.

This raking attachment is comparatively simple, and looks as if it would work well.

It is arranged on good principles, and is not likely to get out of order.

Mr. Owen Dorsey, Howard Machine Shop, Triadelphia, Howard Co., Md., is the inventor, of whom further information may be obtained. Application has been made for a patent.

## MACHINE FOR SAWING MARBLE.



Marble Saw.

The machine illustrated by our engraving is principally intended for sawing up blocks of marble into angular shapes, such as monu-

ments, but it may be used with equal advantage for sawing slabs or any other forms having straight edges. The method of adjusting and changing the angle at which

the saws cut is peculiar, but simple, accurate, and highly convenient.

The saws, A, are hung in frames, B, the upper ends of which swing on bearings at B', which rest in the slots of the arms, C; these arms project laterally from the central cross beam, D. Beam D is swung in ropes like all marble saw frames, and power is applied to D to give it a reciprocating motion in direction of the arrows, and cause the saws to cut. The lower ends of the saw frames, B, are jointed to the saw holders, E; guide pins, F, project laterally from these holders, the pins passing through the slides, G; the pins are for the purpose of guiding and steadying the saws. Slides G move up and down in the slotted arms, H. When the position of these arms is changed, the saw holders, E, will be turned on their joints to the same angle, and the saws will cut accordingly. The arms, H, are attached at their base to rock shafts, I, which extend across the bottom of the machine, beneath its floor; the rock shafts are moved by the hand levers, J J. When it is desired to change the angle at which the saws cut, it is only necessary, therefore, to move the hand levers J J.

The distance apart at which the saws cut is changed by moving the arms, H H; for this purpose, the base of the arms, together with the ends of the rock shafts before mentioned are attached to racks, K K; there is a pair of racks for each pair of arms, H H; if the racks are moved, the arms, H H, will be also moved; slots, L L, are made in the floor, so as to permit the movement of the arms, H H. The racks are moved by means of pinions on the shafts of the hand wheels, M M. In order to change the distance apart at which the saws cut it is only necessary to turn the hand wheels, M M.

These methods of adjusting the saw are both simple and accurate; they are also exceedingly convenient, enabling one person to tend several machines at once, without difficulty. The saws can be made to cut both on the same angle or at different angles, as desired; the various changes can be made at any moment, and even without stopping the machine.

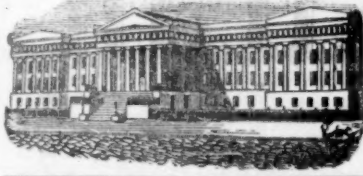
Mr. John A. Cole, Washington, D. C., is the inventor. He will be happy to give further information. Patented Dec. 4th, 1855.

## American Aluminum.

Mr. Alfred Monnier, a metallurgist of Camden, N. J., has made some valuable discoveries in improving the processes for obtaining the metal aluminum. At a recent meeting of the Franklin Institute, Philadelphia, he exhibited large masses of chloride of aluminum large bars of sodium and a quantity of the metal aluminum, thus giving practical proof, of his ability to manufacture the last metal, and the materials immediately used to produce it.

Prof. Jas. C. Booth, has written an article on the subject to the *Philadelphia Ledger*, in which he expresses hopes of this metal being obtained at a greatly reduced cost by Mr. Monnier's processes. At present it is very dear, being about ten dollars per ounce. Mr. Monnier has written us a letter on the subject, in which he states he has made sufficient experiments on aluminum, to assure him it can be produced at a very low price. He says it is not such a bright metal as silver, as has been generally represented, but in some respects it is superior, and will be used in preference to it, and [that it will supersede German silver, and copper, in the manufacture of articles for which those metals are now used. As the materials from which this metal is obtained are very abundant, we hope the processes of Mr. Monnier to obtain it cheap, will prove as successful, as he anticipates.





[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

Issued from the United States Patent Office  
FOR THE WEEK ENDING MAY 27, 1856.

**HEAD BLOCKS OF SAW MILLS**—Lucius B. Adams, of Smithfield, Pa.: I do not claim operating the slide by means of the ratchet and rack and pinion, for these have been previously used.

But I claim the lever, I, with pawl, b, attached, and lever or arm, J, having a roller, K, at its lower end, and the inclined, M, attached to the flooring, L, the above parts being arranged as shown, and operating in connection with the ratchet, H, pinion, F, and rack, E, substantially as shown for the purpose specified.

**STEAM STAMPS**—Wm. Ball, of Chicopee, Mass.: I claim stopping the operation of the stamps whenever the piston is allowed to descend to a certain point by the neglect to feed the material to the mortar in time, as set forth.

**CAR WINDOW**—James Beetle, of New Bedford, Mass.: I claim combining with the movable window frame, A, and its socket frame or opening, B, four bolts, E, F, G, H, and four sets of socket holes, I, J, K, or bars provided with such holes, the whole being arranged so as to operate together, substantially as and for the purpose specified.

I also claim combining with the window frame, A, and its socket frame or opening, B, made in the side of the carriage, two sets of hinged arms, L, K, and M, applied to opposite sides of the frame, and operating essentially in the manner and for the purpose specified.

**PHOTOGRAPHIC PICTURES ON GLASS**—Albert Bibbee, of Columbus, Ohio, and Y. Day, of Nashville, Tenn.: We claim making the border of the picture transparent, and placing the mat back of the picture as described, and for the purpose set forth.

**BRICK MACHINES**—Martin Buck, James H. Buck, and Francis A. Cushman, of Lebanon, N. H.: We claim combining the plunger, U, with the block or mold carrier, W, by means of the rods, D', having the racks, I, on their lower parts, gear with part pinions, C', C'', on the shaft, F', whereby the plunger is allowed to rise more rapidly than the mold carrier, as described.

**ATTACHMENTS FOR PIANO LEGS**—Wm. Clark, of New York City: I do not claim metallic connections attached together by the key passing through mortises in the tongue and jaws, as these themselves have before been used.

But I claim securing the metallic connections for attaching legs to pianos or other articles, into the respective parts of the leg and bed, by means of diagonal dowels, a, and b, taking recesses in the sides of said metallic connections, in the manner and substantially as specified.

**BREACH-LOADING FIRE-ARMS**—Nathan S. Clement, of Worcester, Mass.: I claim rubber packing, or that material which is substantially the same, in connection with breach-loading fire-arms for the purpose specified.

**GRINDING CIRCULAR SAWS**—Wm. Clemson, of East Woburn, Mass.: I claim, the combination of the roll, E, with the grindstone, B, operating in the manner substantially as set forth.

Second, the use of the flat pivot for the purpose of enabling the stone to operate upon the entire surface of the saw.

**BOOT-TREES**—Charles T. Eames, of Milford, Mass.: I do not claim the employment of either two levers, or a single cam, and inclined plane with respect to the foot and leg portions of the boot-tree, whereby the said devices are made to first perform the function of setting the out parts of the tree firmly into the foot of the boot, and next the stretching the leg of the boot, the application of stretching mechanism directly to the upper part of the leg of the tree being rendered unnecessary.

**PORTABLE HOUSES**—Daniel Fitzgerald, of New York City: I claim the constructing houses of staves held together by hoops, as described.

Second, combining the staves in segments or parts of the periphery, some of which shall contain the doors and windows, to facilitate the putting up and taking down.

Third, constructing the floors in segments, as shown.

Fourth, sustaining the thrust of the roof by a hoop which also confines the staves.

**SECURING NUTS TO CARRIAGE AXLES**—Kingston Goddard, of Philadelphia, Pa.: I claim the method of securing screw nuts on axles, by combining with the nut, in the manner and substantially as specified, a spring friction brake to act on the thread of screw by the tension of the spring, substantially as described, the lever or arm of said brake being made to extend beyond one of the faces of the nut, substantially as described, the brake may be withdrawn from the thread of the screw by the act of putting on the screw wrench to take off or put on a nut, as set forth.

**GOVERNOR FOR SIDE WHEEL AND OCEAN STEAMERS**—Wm. B. Godfrey, of Auburn, Iowa: I claim the employment, in connection with a propelling paddle wheel, of a second paddle wheel, termed the governing wheel, fitted loosely to the same shaft, and having applied to it springs, G, G', to control its position relatively to the propelling wheel, when the wheel is out of the water or not in motion, and being connected with a lever, J, or its equivalent, which works on a fulcrum secured to the propelling wheel, and which is connected with the throttle valve or cut-off in such a manner that when the propelling wheel is out of water, or not in motion, the governor wheel will close the throttle valve or cut-off, but when it is in operation in the water, the resistance of the water to the paddles of the governor wheel, will cause the said wheel to move relatively to the paddle wheel and by that means give the throttle valve or cut off more or less opening, substantially as described.

**REED MUSICAL INSTRUMENTS**—Emmons Hamlin (assignor to himself and Henry Mason), of Boston, Mass.: I claim the combination of a rigid or non-elastic wind chest with the ordinary expanding wind chest, connected together and operating in the manner substantially as set forth.

Second, the peculiar construction and arrangement of the coupler, consisting essentially of the tongue, B, inter and between the lever, a, and the key, and operating in the manner substantially as set forth.

**SEWING MACHINES**—Wm. O. Grover, of Boston, Mass.: I claim arranging a box or case for a sewing machine substantially in the manner described, so that when open the box shall constitute the bed for the machine to be operated upon, and hanging the machine thereto to facilitate oiling, cleaning, and repair without removing it from the box and the peculiar adaptation of the handle, so that it may be pushed out when required to drive the machine, and when returned with the box shall serve to prevent motion of the parts whilst the machine is being transported, as set forth.

**GUARD FOR CIRCULAR SAWS**—Henry Grov, of Tiffin, Ohio: I claim the mechanical construction and arrangement of the circular saw guard, to wit, the whole in combination as a useful and novel invention to protect the workmen from injury while working the saw, thereby keeping his hands and person away from the saw teeth, and also preventing injury to him by keeping down the ends of the plank or stick while the saw is passing through it.

**CALIPERS**—Elliot T. Miller, of Charlestown, Mass.: I claim the calipers constructed in the manner substantially as described, and consisting essentially of the fingers, C, plates, F, and elastic blocks, g, as set forth.

**LOCK AND KEY**—E. M. Hendrickson, of Brooklyn, N. Y.: I do not claim the arrangement of one or more jointed arms on a key, such being the construction of what is known as the night latch.

But I claim, first, the construction and use of the key described, which spontaneously projects slender arms, F, through a revolving cylinder, G, for the purpose of simultaneously detaching catches from the bolts.

Second, the combination of the key described, or the mechanical equivalent thereof, with the revolving cylinder, L, the check levers, N, the locking lever, P, and the spring, S, S', substantially as described and for the purposes set forth.

**FLOATS FOR STEAM BOILERS**—F. A. Hoyt, of Boston, Mass.: I claim charging the float with compressed air, for the purpose substantially specified.

**SHIRING HAT BODIES**—S. C. Ketchum, of Brooklyn, N. Y.: I claim the use of the combination of the elastic shell, D, upon the revolving drum or cylinder, C, with the vibratory rubber case, L, surrounding the same, when made and arranged for the purposes substantially as set forth.

**MOWING MACHINES**—Wm. F. Ketchum, of Buffalo, N. Y.: I am aware that Erace L. Emery, of Albany, has heretofore used a levered arm, with a wheel thereon, at the outer end of the cutter bar behind the shoe, for the purpose of elevating and depressing the cutter bar at pleasure, to adapt it to working or traveling, and that a similar arm and wheel, for a similar purpose, have been placed at the inner end of the cutter bar behind the shoe. These I do not claim.

But I claim attaching any where between the shoes to the back part of the cutter bar of a mowing machine, an adjustable and jointed lever, either with or without a wheel, for the uses and purposes described.

**OPERATING STEAM ENGINES**—C. K. Landis, of Philadelphia, Pa.: I am aware that a vacuum has been formed by the condensation of steam for the purpose of raising water, and that steam has been employed to force water out of a vessel into the atmosphere.

I claim the combination of the float, d, slide valve, i, and double valve, q, constructed and arranged as described, and for the purpose specified.

**SAFETY VALVES FOR STEAM ENGINES**—A. B. Latta, of Cincinnati, Ohio: I claim the mechanical means described for the purposes set forth, or any equivalent arrangement.

**CORROD GIN**—Wm. B. Lindsay, of New Orleans, La.: I claim the combination of the screw, a, with a vibrating stripping card, E, and ribs, c, arranged and operating substantially as shown and described, for the purpose specified.

**EXCAVATOR**—C. A. Mann, Jr., of Pike, N. Y.: I claim the construction and arrangement of the cylindrical chamber, u, u', formed with the inserted semi-rotating arms, v, the scoop, x, the fingers and friction disks, y, z, &c., with the combination therewith of the springs, 6, 7, 8. The whole operated through the obliquely arranged wheels, t, in combination with the bowed cam plates, 16, 17, 18, substantially as described.

I also claim the arrangement of said devices in combination with the adjustable or graduating framing, e, g, J, J', the plow attachment, c, as set forth.

**GOVERNORS FOR STEAM ENGINES**—Wm. W. H. Mead, of Chester, N. Y.: I claim combining the fly governor with the throttle valve, by fitting it loosely to the spindle, D, and driving it by friction from a wheel, F, which is loose on the same spindle, and which derives its motion from the said spindle through a spring, e, the said wheel, F, being connected in any convenient manner with the throttle valve or cut-off, so that it may be caused by the retarding or advancing effect of the motion of the spindle of the governor or fly, as the speed of the engine is suddenly increased or diminished, to diminish or increase the supply of steam to the engine, substantially as described.

**BORING HUBS**—H. L. Mooney, and W. R. Carter, of Astoria, Ill.: We claim the mode of receding of the cutter from the center of the hub during the progress of the excavation.

But we claim the construction of the tool with the excavating and shouldering cutters in separate slots, capable of a simultaneous outward movement, and relatively so situated that the shouldering cutter is made to perform the double function of cutting the shoulder and holding the tool firmly upon the hub, as set forth.

**WINDING THREAD FROM SPIKES**—Marcus Ormaboe, of Boston, Mass.: I claim the arrangement of the hooks, a, the spools, C, and the elastic strap, B, operating in the manner substantially as set forth.

**BILLIARD CUES**—Conrad Leicht, of New York City: I claim the mode of making a cue, and adjusting the same to the cue in the manner as described.

**MUSICAL NOTATION**—Philetus Phillips, of Middletown Point, N. J.: I claim the use of a line of a distinct character on which to write each element, note, and the transposing of such lines in the manner described, to effect and denote the different transpositions of the scale.

**LOGS**—Robert Filson and S. P. Heath, of Laurel, Md.: We claim the combination of a balance chain, in combination with the balance weight in the lathe acting from gravity, also for the purpose described.

**CLEANING GUTTA PERCHA**—James Reynolds, of New York City: I do not confine myself to the employment of the particular machinery described.

But I claim the mode of cleaning the bark and foreign substances from gutta percha by cutting the blocks of the raw material into extremely thin slices or sheets, and submitting the said slices or sheets to a beating or rubbing and screening operation, substantially as described.

**HAND PROPELLERS**—J. G. Ross, of New York City: I claim the plate and lance point, F, in connection with the propelling bucket, constructed, and operated as specified.

**SELF-SEALING PRESERVE VESSELS**—Wm. J. Stevenson, of New York City: I do not claim the sealing of vessels by a packing ring and a cap, which is held down by atmospheric pressure.

But in combination with the month, a, of the vessel, constructed with a shoulder, b, at some distance from its entrance, and a packing ring, c, resting on the said shoulder, I claim the cap, e, made with its bearing part smaller than the exterior of the ring, and with raised guide pieces, d, d', which keep it in place in the month, so as to cause it to get a certain width of bearing all around the ring, but do not prevent the necessary inward movement of the edge of the bearing part of the cap in the packing, substantially as described.

**VALVE GEAR FOR STEAM ENGINES**—Horatio Winter, of New York City: I claim, first, an eccentric on the main shaft, a lever properly governed and connected therewith, and a crank upon a secondary shaft, the whole in combination and connected each to each, substantially in the manner and for the purposes set forth.

Second, I claim an eccentric, or its equivalent upon a revolving shaft, in combination with a rod or lever connected therewith, receiving a reciprocating motion from the eccentric, and a vibrating motion, substantially in the manner specified, whereby the valves of steam engines may be raised and lowered, substantially as described.

Third, I claim forcing rods or levers, caused to reciprocate, as specified, to vibrate in the plane of their reciprocation by a positive motion derived from some convenient part of the engine, through the intervention of bell cranks, radius bars, and links, or their equivalents, connected and acting substantially as set forth.

Fourth, I claim changing the center of vibration of reciprocating vibrating levers, or altering the distance through which they vibrate, substantially in the manner described, in combination with a toe or foot curved substantially in the manner described, whereby the period of cut off may be varied, as specified.

Lastly, I claim altering the position of the pivots of a bell crank provided with a link and radius bar, substantially in the manner described, so that the period of cut off may be varied at the pleasure of the attendant.

**SHIP CAPTAINS**—Samuel Gaty, of St. Louis, Mo.: I am aware that captains have been and are being employed, for effecting the same purpose, but they have not been arranged in a complicated way, were liable to get out of repair, and consequently are not in general use.

I claim the arrangement of the ship's cap and pawls and spur wheels and pinions in capstans or windlasses, so the simply reversing the prime mover will change it from a simple to a compound capstan, without changing any of the parts by hand, and so that also the spur wheels and pinions may only rotate when used as a compound capstan and be self-unwinding when changed to a simple one, as set forth.

**MAKING STEEL**—Franz Uchatius, of Vienna, Austria. Patented in Austria, March 14, 1855: I wish it to be understood that, in carrying out my improved process, I do not confine myself to the use of the precise materials enumerated, as others, doubtless, may be found to yield oxygen as required for the carrying out of the decarburizing process.

But I claim the conversion of pig iron into steel by subjecting the same, when reduced to a granulated state, to the combined action of oxidizing agents, and the requisite fluxes, whereby I am enabled to manufacture cast steel of determinate quality, and obtain it at one melting, as described.

**ROTARY KNITTING MACHINES**—Clark Tompkins and John Johnson, of Troy, N. Y.: We do not claim any arrangement of a tension rod or roller to give even tension to the flat or now revolving circular fabrics of knitting looms or machines at the same time such fabrics are produced and taken up.

Nor do we claim any mode of causing the tension rod or roller to such stationary machines to so govern the motion of the beam that it shall take up the fabric as fast as produced.

But we claim the combination of the tension roller, A, arranged substantially in the manner described, with the take-up mechanism described, or its equivalent, when applied to rotary knitting machines, for the purpose set forth.

**SECURING PLANE BITS**—T. D. Worrall, of Boston, Mass.: I do not claim merely holding the plane or cutter in place in its throat by a wedge, screw, or equivalent device, forced into the throat and across it and against the plane iron.

The arrangement of the clamp, D, and the screw rod, E, with respect to the plane cutter, and its stock, substantially as described.

**GRAIN AND GRASS HARVESTERS**—Jas. T. Youart, of Troy, N. Y.: I do not claim separately the reciprocating frame, B, with sickle, C, attached; nor do I claim any form of vibrating cutters separately.

I claim the cutting device formed of the reciprocating frame, B, with the straight edged sickle, C, attached in combination with the square edged collectors, D, connected with the frame, B, and having a vibrating movement, the above parts being constructed, arranged, and operating as shown, for the purpose specified.

**REPLACEABLE AXLE BOX FOR R.R. CARS**—Wm. D. Arnett, of Cincinnati, Ohio: I am aware that boxes have been used so that the bearings under other parts can be taken out separately without removing the stay bar, this I do not claim.

But I claim the arrangement, as described, by which the axle box can be removed from the plane or cutter and bearings, said box or case being slid into place, and attached to the piece upon which the spring rests, by means of the lugs, 4, and recess, 11, substantially as described.

**DRAWING FLUIDS FROM BOTTLES**—J. V. Fox, of Durhamville, N. Y.: I am aware that the plugs of faucets have been surrounded with leather, gutta percha, and some other similar substance to pack them, therefore, I do not claim, broadly, surrounding them with such substances.

But I claim packing the plugs of faucets, substantially as described, with insulating material, such as gutta percha, and some other similar substance, when the same piece which packs the plug, is made to pack the end of the bottle nose, tube, pipe or other article to which the faucet is applied, substantially as described.

**SHINGLE MACHINE**—Henry White, of Oneida Castle, N. Y.: I claim the plates, b, b', so arranged as to bring the out of the shingle into the desired circle between the knives and hold it there while it is being shaved.

I claim the spring forceps, so arranged as to seize and remove the shingle after it is shaved, substantially as described.

**COUPLING FOR VEHICLES**—Harvey Miner and H. M. Stevens, of New York City, and Wm. H. Saunders, of Hastings, N. Y.: We claim a ring of vulcanized rubber or some other yielding and more or less elastic material applied substantially as specified, in combination with a divided eye and a bolt or pin fixed in the clips, either immovably or in such manner that it can be taken out and replaced, the whole being applied to a vehicle, and acting substantially in the manner and for the purposes set forth.

**SHIPS' CAPTAINS**—Daniel and George Talbot, of Oswego, N. Y.: We claim the gear, J, K, arranged at the top of the capstan, in combination with the shaft, L, and gear, O and B, arranged at the bottom of the capstan, for communicating a slow and powerful motion to the barrel, F, substantially as described.

**FELLIES**—A. B. Richmond, of Meadville, Pennsylvania, first, I claim the saws constructed as described, so that they may be adjusted at any required circle by means of the setscrews, 9, and also constructed as described, with the saw hand, fingers, slots, and set screws combined as described, or any other construction substantially the same.

I do not claim the saws alone, but constructed and with the aforesaid combination, as described.

Second, I claim the contrivance and construction of the platform, I, with the combination of gauges and set screws, as described, for cutting the felly the proper length, or any other substantially the same.

Third, I do not claim the bits driven by a hand alone. But I claim the combination described, by which the bits for the spokes and dowl pins are made to move towards the felly at the same time or different times, as may be desired, by means of the combination and construction described, or any other substantially the same.

**SELF-ACTING MULES**—W. W. Wier, of Chicopee, Mass., and W. W. Grover, of Holyoke, Mass.: We claim the application to mules of the faller, C, denominated a third faller, operated by the mechanism described, or its equivalent when used in combination with a faller and counter-faller, substantially as described, and for the purpose specified.

We also claim the combination and arrangement of the levers, G and H, and latch, F, substantially as described, for the purpose specified.

**PLOWS**—George W. Zeigler, of Tiffin City, Ohio: I am aware that Harrison Norton obtained a patent dated October 9th, 1855, by which he regulated the depth of the furrow by a movable plow point acting upon the same principle as shown. I do not claim, therefore, to have the first to invent that method of accomplishing this object.

But I claim, simply, an improvement upon the invention of Norton, such as set forth, that is to say, combining with land side and mold board, a coultter, F, pointed to the land side, as described, and movable between land side and mold board, independently of the mold board and share.

**CORN SHELLERS**—C. S. C. Crane, (assignor to S. M. Tinkham), of Taunton, Mass.: I claim the shelling wheel, C, toothed or corrugated on both sides, the pressure arm, R, R', provided with plates, e, on their upper ends, and the feeding device composed of the uprights, b, b', and the board, Q, operated as shown, the parts being arranged and operating conjointly as shown for the purpose specified.

**SLIDE VALVES**—J. F. Allen, of New York City (assignor to N. L. Cole, of Norwich, Conn.): I do not confine myself to the particular mechanism described for giving the requisite movement of the movable seat, E, as this may be done by various mechanical contrivances. I claim the movable valve seat, E, arranged and operating substantially as described, between the valve and the usual valve seat.

**PANORAMA ORGANS**—Thomas Sands, of Chelsea, Mass. (assignor to himself and J. P. Lindsay, of Roxbury, Mass.): I claim arranging the pipes horizontally in compact tiers, above the other, when each succeeding tier is placed at a greater distance from the wind chest than the one below it, for the accommodation of the mouths of the pipes, all the pipes except those of the lower tier being connected with the wind chest by means of the conductors, G, as set forth.

Second, I claim the peculiar combination and arrangement of the action described, with the short keys, H, that is to say, the combination of the keys, H, the levers, I, the stickers, K, and the jacks, L, operating in the manner and for the purpose substantially as described.

Third, I claim the coupler rods, N, with their bent wires, g, in combination with the stickers, K, and the auxiliary stickers, p, for the purpose of coupling the notes with their octaves, as set forth.

Fourth, I claim the method described of holding the metallic pipes in place by means of the bar, P, the rod, m, and the spring, Q, operating in the manner described.

## RE-ISSUE.

**PLANING HAT BODIES**—Albert Spencer and Albert E. Laing, (assignees of Phineas Emmons), of New York City. Patented April 19, 1855: I claim the use of an endless table or band, having a differential or vibratory forward revolving motion, in combination with a rubber or presser operating substantially as set forth, whereby a forward vibratory rolling and pressing motion is given to the roll of hat bodies or felt for sizing it up, and at the same time carrying it through the machine made and operating substantially as set forth.

## ADDITIONAL IMPROVEMENT.

**COUPLING FOR CARRIAGES**—A. J. Gibson, of Clinton, Mass. Patented Sept. 12, 1854: I do not claim the invention of either a seat connection, or a screw for supporting or confining one thing to another, my invention having reference to a particular article as patented by me, and to certain arrangements of parts connected therewith.

I claim arranging above the threaded bolt, and with respect to the guard from which it extends, as described, a seat or connection for the spring or other part of a carriage, as specified.

I also claim arranging in the threaded bolt, and so as to pass up through it, and its rest, a socket or passage for the reception of a screw bolt, serving not only to confine a spring or bar down upon the seat, but for the specific purpose of preventing accident in case of breakage of the threaded bolt at its neck, as specified.

## DESIGNS.

**COMBINED MATCH SAFES, PAPER WEIGHTS, AND PIN CUSHION**—M. B. Dyott, of Philadelphia, Pa.

**PORTABLE RANGES**—James Horton and Jno. Currie, (assignors to Cox, Hager & Cox), of Philadelphia, Pa.

**PIANO-FORTE LEGS**—Albert Bosworth, of Westfield, Mass. (assignor to himself and T. H. Loomis.)

## Mammoth Sugar Mill.

One of the largest sugar mill engines which has ever been made in the United States has just been completed at the Novelty Iron Works, this city. The designs were furnished by the Cuban agent, Mr. Charles Edmondstone. We understand that this gentleman has for many years been employed in the manufacture of sugar machinery at the West Point Foundry, the Morgan Iron Works, and at the Novelty Iron Works. The engine is of the beam or vertical plan, and the architecture decidedly Gothic. The beam is handsomely and substantially supported by a framing of six gothic grouped columns, the tops of which agree with an angular line drawn from the center of the beam to the center of the fly wheel shaft on one side, and extending to the center of the base of the cylinder on the other side, so that on the descent of the arms of the beam the strain presses on the tops of the columns, and the pull upward of the other arm is equally felt on the three remaining columns on the other side of the center.

The three columns on each side diminish in diameter and height as they recede from the center, the intervening spaces being filled in with gothic arches and moldings. The piston rod being guided by a Watts' parallel motion, is supported by an entablature, sprung from main columns and carried out on both sides beyond the cylinder and crank shaft, ultimately resting at each termination on two light appropriate columns, giving an open view to the engine and a full view of the motion as it forms its several angles. The valves are of the conical or puppet form, from Allen & Wells' patent, being likewise balanced valves.

The steam cylinder is 22 inches in diameter, and 5 feet stroke, intended to work up to eighty pounds pressure per square inch.—The fly wheel is 20 ft. in diameter, having a rim of 12x6, and weighing about 10 tons, the whole being supported by a massive bed plate of 5 tons weight. The front of the cylinder has a register and steam gauge, the former to mark the number of revolutions, the latter to indicate the working pressure. On the end of the fly wheel shaft is a pinion of 22 inches diameter, gearing into a spur wheel of 22 ft. in diameter, having 12 immense arms and segments, all made to come apart in pieces for the convenience of shipment. This wheel is supported by two massive iron stands, and its shaft couples to the top roll of the mill, which consists of three rolls, 30 inches diameter and 7 ft. long—the top one weighing 9 tons, and the two lower 8 tons each. The front and top rolls break the cane, which pass to the back, where they are ground. These rolls are supported on two strong and massive frames weighing 5 tons each, which rest on a bed, weighing, including juice pan, about 4 tons. The mill is calculated to make only 2 1-4 turns per minute, to run a stream of juice capable of making 20 hogheads of sugar per diem.

The boiler has a diameter of 68 inches, and is 35 feet long, with five 12-inch flues. The gothic order has been thoroughly carried out in every part of the machinery, and the finish of the wrought-iron is of the highest order. It is made on purpose to come in competition with the best machinery of England, which has for some time controlled the Cuban market.



[From the New York Herald.]  
**Senator James' New Patent Law.—A New Political Machine.**

Senator James, the Chairman of the Committee on Patents, has reported to the Senate and recommended the passage by that body of an act entirely remodeling the whole system of patents in this country. We have carefully examined this new project, and find it impossible to approve even a single suggestion it contains.

It is indeed impossible that the Senate will not regard it as an attempt to organize another spoils department at Washington, with limitless means of making money, of buying up and selling out friends; in short, another land system—another Indian Department. It is only a bill—a project—but it was heralded to the world by the most singular unanimity of endorsement by the newspaper correspondents at Washington. It was so suddenly approved, and so earnestly approved by all the news reporters—the telegraph was so liberally employed to herald and proclaim its birth, that to suggest the possibility of its not being an excellent measure was a species of heresy.

Now, the bill before us is perhaps the most cunningly devised scheme by which great power was to be concentrated in the Patent Office, and vast means of corruption secured to the Patent Commissioner, which has ever been devised in our country. It starts off in the first section by giving the Commissioner judicial functions. The second makes an inventor of a man who steals a work not discovered or published in this country. The sixth gives to patentees and assignees extension from five to twenty years, at the option of the Commissioner. By the present laws, the patentees alone have the right of extension after fourteen years to twenty-one years, on proof that the inventor has derived no advantage from his patent. The sixth section cuts off the inventor entirely, and confers the right of extension upon the assignee. The seventh section exempts patents from attachment for debt. This is evidently intended to cover the operations of the speculators, and even to shield them against the obligations they may have incurred to the inventor himself. The Spaniards have a maxim that it is better to be an executor than an heir; so with Mr. James, it is by far better to be an assignee than an inventor. By the ninth section the Commissioner of Patents is authorized to appoint limitless agents. The power to appoint draws with it a reasonable compensation.

Then comes the organic powers of the scheme. The eleventh section takes away appeals to the Chief Justice and the Judges of the Circuit Courts, and concentrates upon the Commissioner the final decision of all questions relating to the granting and extending of patents. It is followed in the succeeding section by an elaborate system of fees on the hearing of all questions before the Commissioner—and these may be enlarged from the sum of about thirty dollars under existing laws, to near three hundred and fifty dollars. It is easy to see that patent differences would be wonderfully multiplied under such an arrangement, and that the Commissioner would be exposed to terrible temptations to prolong disputes. The thirteenth section takes from the courts the power of determining the validity of patents, and confers it upon the Commissioner; and the eighteenth section gives to that functionary a million a year of printing patronage, which, if we consider the immense power proposed to be conferred upon him otherwise in the bill, we cannot regard as too much.

Now, here is a scheme of magnificent proportions. Under it the office of Commissioner of Patents will be worth, in the hands of any first rate politician, five hundred thousand dollars a year. An honest man could not fail to get rich out of it—that is, if honesty was conventional only, and he was willing to take "all the law allows." The literal of the bill is this, that it proposes to set up a patent fraud machine, by which fortunes are to be ground out of any conceivable height, depth, and breadth. Pass it, and Colt and Goodyear, and all the patent men at Washington—the whole "five thousand assignees"—will be at once the friends of the Commissioner. Five

thousand assignees, with millions of value exempt from execution! They can afford to be liberal—they will be liberal. Ten to one they are liberal now even, in anticipation of the passage of Mr. James' bill.

The Committee on Patents, then, think it well enough to enlarge the number of inventors—to increase the sum total of American geniuses—by special enactments. They make a man a discoverer of everything not invented or published in this country! That is certainly an original way of rewarding merit—the most expert thief is not only protected by the law, but all the people are to be required to pay him a tax for twenty years, as a reward for the enterprise he manifested in importing an invention before somebody else.

If we refer to the simple fact that the city of Washington maintains thousands of agents—land agents, claim agents, patent agents, pension agents, corporation and railroad agents—an army of mercenary leeches, sucking at the treasury, besieging Congress for the passage of laws by which the treasury is to be tapped—bribing, corrupting, and demoralising members—we shall be able better to understand the object and scope of the new patent bill. It is a species of passport to commit legal fraud upon the people. It is a rival effort to make the Patent Office what the Land and Indian offices have ever been—a sink of iniquity, a scene of plunder, a disgrace to the Union.

But is it necessary thus to put up the inventive genius of the country at auction? What else is the purpose of the Senate bill? The rights of every inventor by it are lodged in the hands of a Commissioner, without appeal; and that functionary, besides possessing the exclusive power of assigning rewards, is backed by a printing disbursement fund of a million a year.

[From the Savannah (Ga.) News.]  
**The New Patent Bill.**

We have already noticed the bill now before the Senate, designed to amend the acts now in force in relation to the Patent Office. The publication of the bill has brought out many strong arguments against its expediency and its justice. It is said, indeed, that the only supporters of the bill are the assignees of certain profitable monopolies now about to expire, and who have repeatedly been defeated in their efforts to get their patents extended.

The principal objections to the proposed bill are that it greatly increases the expenses of applying for patents and renewals; that it makes the Commissioner of Patents the judge and jury in deciding the question of the validity of a patent, taking this power from the Courts, where it now belongs; and that it largely increases the amount to be expended by the Patent Office, for printing, binding, salaries, &c.

Perhaps the strongest argument against any radical change may be found in the fact that hitherto our patent system has been considered the most simple and perfect in the world, and has been a model for England and other nations who have adopted some of its features.

The SCIENTIFIC AMERICAN, the ablest mechanical journal in the country, thus speaks of the proposed bill:

[Copious extracts from our columns follow here, which we omit.]

#### The New Patent Bill.

The following communication is written by an inventor, who is the author of several very ingenious improvements, and the holder of quite a number of patents:—

Messrs. Editors.—Knowing well my inability to the task, it is extremely seldom I write; but when I behold so much of insult upon common sense as is contained in the proposed improvement, (?) as published in the SCIENTIFIC AMERICAN, upon our patent laws, I cannot hold my peace.

The extant patent law was based upon the equitable platform of reciprocal benefit to the inventor and the public, by the establishment of a relation in which genius should be rewarded by an exclusive right to its productions for a definite period, and for the consideration of exclusiveness, the public became the proprietors of it at the defined time.

That the contemplations of the law have

been realized I believe to be established beyond controversy, and I cannot conceive any apology for not "letting well enough alone."

The proposed law, on the other hand, must fail in securing the salutary and equitable ends, which, as above alluded to, is the case with the present law. The latter provides for the issue of letters patent, granting genius a protection for securing its remuneration during a period of fourteen years, whereas the proposition under consideration is its reduction to the term of five years. Now, gentlemen, I venture the assertion that nineteen-twentieths of all the patented inventions which are prosecuted as a business, yield no actual profit to any interested party for the first five years of its existence; and when remunerative profits do accrue, it is after the expiration of this term. Very many do not prove remunerative until even after the expiration of fourteen years, in consideration of which fact a provision now exists for an extension of seven years more, when it is evident that the fourteen years privilege has failed to remunerate the inventor for his talents and money expended in the developments of its productions. Prominent in the catalogue of this description of patented inventions stands Scott's revolving pestle, if my memory serves me correctly in reference to its history.

As you observe in your remarks upon this new Patent Bill, a very large number of patent rights are assigned by the inventors, who are generally poor, to those who are rich, and who cannot use the money invested in the purchase of such patent rights and its introduction for public use, equally profitable in any other direction. If now, the term of fourteen years exclusive right in an invention—the first five of which do not yield much, if any, profit—is the criterion by which the value of such invention and exclusive right to it is valued, how in the name of common sense is the inventor to be benefitted by reducing the time in which he is to be remunerated for his talents from a period which is proven by experience to be barely sufficient for the object, to one which is equally well known cannot remunerate him, either as proprietor or assignor of his letters patent?

On the other hand, we find that comparatively few of the letters patent granted for fourteen years, are asked to be extended beyond that period, proving that period to be sufficient to satisfy the inventors in the majority of cases; and, at the same ratio, the public became proprietors of the inventions after the expiration of the fourteen years. How, then, is the public more benefitted by the proposed than the existing law, when, in connection with the last stated fact, is taken into consideration the necessity of asking an extension of fifteen years beyond the five years for which the patent, under the new bill is to be granted, in order to render the patent profitable or remunerative to the genius who secured it? Does not this arrangement procrastinate the public proprietorship of an invention six years beyond the time assigned to it by the existing law? If, then, neither the inventor's nor the public's interests are enhanced by the provisions of the new bill, whose interests does it contemplate to promote?

Why, gentlemen, in your remarks upon the bill you have not half answered the question in naming the "assignee or assignees" of the patents to the inventions. I add lawyers and knaves.

The thousands of graduates from our law schools will, in this bill, find ample field for the exercise of their profession, and thus secure one of the means of increasing the demand for, equal to the supply of lawyers. A philanthropic object, truly.

Without pretending to detailed criticism of the proposed Bill, I might have prolonged my already long remarks; but having no doubt that abler pens than mine will address you upon this odious attempt at legislation, I dismiss the matter at present. Hoping every effort to diffuse correct views on this important subject will be crowned with deserving success,

I am yours, H.

**The McCormick Reaper Patent Extension Refused.**

The Senate rejected a Bill before it, last week, for the further extension of the patent for McCormick's reaper. There is but

very little fear of this patent ever being extended; its owners are but wasting money in such efforts.

#### Hot Air Locomotive.

On page 181, this volume SCIENTIFIC AMERICAN, we stated that a large hot air locomotive was being built at the Novelty Works, this city, to test the principle of hot air in locomotives on a large scale. That engine has been completed, and experiments have been made with it upon a branch of the New York and Erie Railroad, between Paterson & Hackensack Bridge, N. J., and these resulted in total failure.

So far as material and workmanship were concerned, it was perfectly adequate for its work. It was strongly built, and well put together, but complicated. The experiments, although every care was taken, and every effort used to insure success, resulted unsatisfactorily. The *Vampire* now stands at Paterson silent and breathless—the air in that neighborhood being insufficient to put and maintain the machinery in motion. After so much expense has been incurred, and so much study and care has been expended, it is to be regretted that a complete failure has taken place. The inventor must have been very sanguine in his expectations, or so much money would not have been spent. A machine of a plainer and cheaper construction, we think, would have answered for what of necessity the first trips would be—experiments.

In some respects the *Vampire* resembles the common locomotive, having a boiler of the ordinary appearance—a 24 inch cylinder, 22 in. stroke, two pair of drivers, 6 feet diameter, a link motion, feed pumps, and a tank containing about 1000 gallons. The design of the invention was to use steam and expanded air. The process was as follows. An air pump, worked from the main cylinder, pumped air into a cylindrical air vessel; from there it issued through copper pipes as a blast, under and into a heater or fire box, which was self-feeding with coal; the consumption of twelve tons being calculated for ten hours. A jet of water was thrown upon this fire, and upon a heated upper plate. The water vapor and gases, the expanded air, and likewise the steam from a water space around the heater, all combined, were then passed through a linked chamber 12 inches diameter, into the forward part of the boiler shell, and from thence through pipes round the cylinder, then into the cylinder—these gases and vapors being the motive power. The exhaust was returned into the cylindrical air chamber, thence into the chimney.

The results of the experiments were, that the *Vampire* did not go more than a mile and a half at a time, and that at the low rate of from 10 to 12 miles per hour; the steam was raised to 56 and 110 lbs., but could not be maintained; the cylinders were elevated to such a temperature as to discolor the iron, and they were so cut or grooved up, by the small ashes and dust entering them with the gases, as to demand their being twice bored out; and, lastly, the injection water on the fire nearly put it out.

The weight of the *Vampire* is 44 tons; and since the experiments have proved so unsuccessful, the owners propose remodeling her into an ordinary steam locomotive.

What comment do these results suggest? Simply that the very vapor and gas which were to be the motive power, destroyed the materials employed to retain them. Under this arrangement, hot air is perfectly inadequate to the wants of locomotion, and will bear no comparison with the principles at present so successfully employed in steam locomotion.

The failure of this novel motor is both remarkable and droll. The performances of the engine were such that it actually roasted and extinguished itself. It over-heated its air box and damaged its cylinders, and the water designed to be vaporized extinguished the vaporizer. We understand that the funds for building it were furnished by a party of capitalists who, though wise and well informed regarding stocks and coupons, lost their money in this case, for want of being posted up in the Hot Air controversy.



## New Inventions.

## Recent Foreign Inventions.

## New Composition for Picture Frames, &amp;c.—

A patent has been taken out by E. Gibbs, London, for manufacturing molded articles from a composition made of the asphaltum of tar and fine brick dust. This asphaltum is the residue left in the retorts in distilling gas tar to obtain naphtha. It is kneaded with one part of brick dust, and then molded into the desired form for picture frames, or any other article desired. From such cheap materials, it appears to us that a composition may be made which can be vulcanized, and from which many articles like canes and combs, might be manufactured.

**India Rubber Varnish.**—A. Ford, of London, has obtained a patent for making solutions of india rubber and gutta percha, which solutions can be used for water-proofing as a varnish. The india rubber or gutta percha, is dissolved in warm turpentine or naphtha. The turpentine, or naphtha, is prepared by mixing a caustic alkali, such as potash, in it—one pound to the gallon—then agitating them in a suitable vessel, and allowing them to stand for about three days, when a dark colored residuum is found at the bottom. The clear liquor is then poured off and used for dissolving the india rubber. It is stated that this makes a very beautiful varnish.

**Preserving Meat.**—Francois M. Demait, of Paris, has patented a peculiar method of treating meat to preserve it for use, like our common smoked beef. The meat to be preserved is cut into pieces and strung on a cord at a suitable distance apart from one another. These are then hung on rods and suspended in an air-tight chamber, which has a furnace at its bottom. The chamber is then heated up to about 100° Fah., and a preparation of 4 ounces of the flour of sulphur, 2 1-2 of lime, and a handful of green mint leaves are thrown upon the fire, and the doors closed. An opening in the bottom of the chamber admits the gas from the furnace, to the action of which the meat is submitted for 18 hours. At the end of this time the meat is withdrawn, and suspended in a moderately warm room, where it is dried. This process is stated to make finely flavored dry meat, capable of keeping a long period. The pieces of meat are pressed to remove the blood before being strung on the cords.

**Composition substitute for Wood, Bone, &c.**—F. C. Lepage, of Paris, has secured a patent for a new and apparently very useful compound of albumen and saw dust, from which various molded articles can be manufactured. Pure albumen, obtained either from eggs or blood, is slightly diluted with water, and in this, fine sawdust is soaked. It is then submitted to severe pressure in a press. After this it is forced into metal molds, being pressed into the mold, which should be kept heated. As soon as the molding is completed, the mold should be plunged into cold water to cool the articles which may then be taken out. It is stated that this makes very beautiful and useful ornaments for picture frames, cornices, combs, brooches, &c.

## New Method of Rolling Railroad Rails.

In the engraving, rollers, A B, are provided with five grooves, numbered respectively in fig. 1 from 1 to 5, in the order of succession, in which they receive the bar to roll it, the bar being taken from the roughing or billeting rollers, and passed through groove 1, and afterwards through 2, 3, 4, and 5, the latter of which finishes it.

The improvement consists in the form of the groove 3, by which a depression or cavity is formed all along the center of the base of the rail after the reduction, to form the head, has been, to a certain extent, effected by the grooves, 1 and 2, but before the further reduction to form the neck is commenced, so that by the subsequent operation of the groove 4, which reduces the middle of the bar to form the neck, and bring it nearly to the proper shape. The metal is easily displaced from the middle of the bar, and driven towards the base, to fill the depression or cavity which

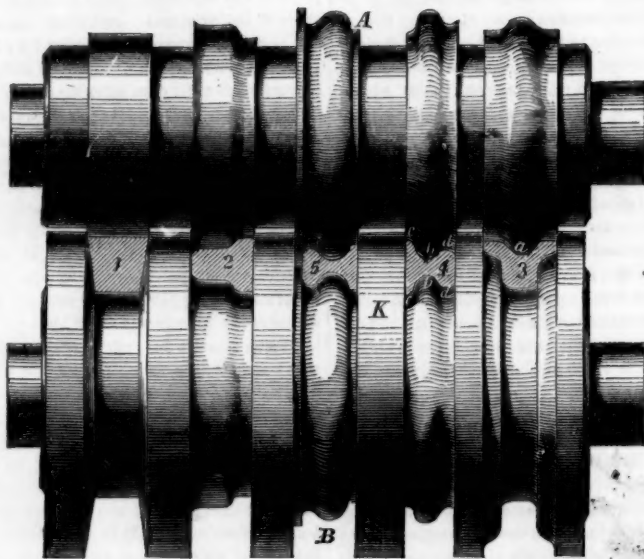
has been made by the upper roller, A, in the middle of the base, during the passage of the bar through the groove, 3. The inventor also proposes to employ a groove similar to 3, in place of 1, so as to produce a cavity along the center of the base of the rail during the early stages of the process.

To show the direction in which the metal is displaced from the center of the bar towards

the base, the diagram, fig. 3, represents the two forms of the bar after leaving the groove, 3, and after leaving the groove, 4, the former being shown in light outline, and the latter in dark, the depression or cavity in the base produced in groove 3, being indicated by the letter *a*. The effect which the previous formation of the depression or cavity, *a*, has in the rolling of the bar in the groove, 4, is illustrated

## IMPROVED METHOD OF ROLLING IRON RAILS.

Fig. 1



ted in fig. 2, where the three pairs of circles, *b c d*, represent severally those parts of the groove, 4, of the roller, which respectively roll the flanges of the base, the neck, and the head, *C*, in the same figure represents that portion of the bar which has not yet entered the groove, 4, and *D*, that portion which has passed through the said groove. The lines, *e e*, represent the base of the rail, *f f* the head, and the dotted lines, *g g*, the neck. In this

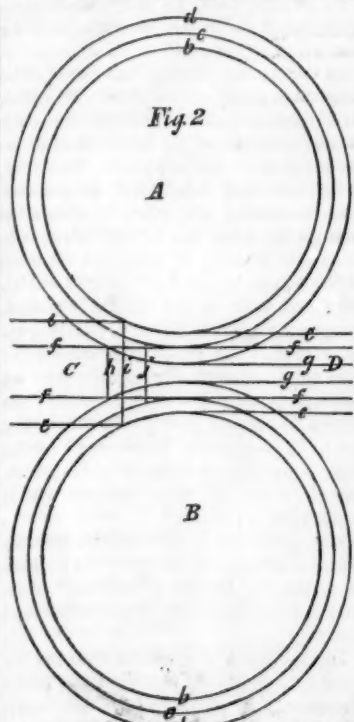


Fig. 3



figure it is shown that the largest parts, *d d*, of the rollers come into action on the bar as the latter, arrives at the position of the line, *A*, but the parts, *b b*, do not come into operation till the bar arrives at the position of the

line, *i*, and the parts, *c c*, not till the bar has reached the position of the line, *j*, by which means the iron is forced by the parts, *d d*, from the middle of the bar towards the collar, *k*, of the roller, *B*, against which the base of the rail is formed (see fig. 2) before any of the parts that roll the head and flanges come into action. The middle of the bar is in this way reduced to two-thirds of the thickness it was at the time of entering the rollers before the flanges are operated upon, and by the time the operation on the head of the rail commences, it is reduced nearly to the proper thickness for the neck of the rail, and the depression or cavity in the base is quite filled up; and the several parts of the roller being properly proportioned, there will be no more thickness left in the middle of the bar to extend it lengthwise than there is in the base and head, and consequently all parts of the rail will be drawn or extended in a like degree, and be of equal density.

Those of the grooves of the rollers which are not particularly described, are assumed to be similar to those in the rollers of other rolling mills for the same purpose.

By this process of rolling rails there are three very important and valuable advantages gained: 1st, the making of a greater number of perfect rails from the same amount of iron heated. 2d, the greater density and durability of the rail. 3d, the making of the rail perfectly sound with crystalline iron in the head.

We are informed that this process has been in use for more than a year past at the Mount Savage Iron Works, Md., in the manufacture of rails for the Baltimore and Ohio R. R. Co. We are told that the results demonstrate beyond all peradventure that the invention is one of great value. The rails produced are said to be of a superior quality, far more durable, and worth more in market. The subject is well worthy of the careful attention of engineers and those interested in railroads.

Mr. John W. Brown, Mount Savage Iron Works, Md., is the inventor, and will be happy to give any further information. Patented April 1, 1856.

## Preventing Boiler Incrustations.

At the Brooklyn (N. Y.) City Mills, where large quantities of flour are made, the motive power being steam, they are using with great success one of Mr. G. Weissenborn's patent apparatus for preventing incrustations in the boiler. The water found in Brooklyn contains a large percentage of lime, which engineers

know is very detrimental to steam boilers. They become thickly crusted over with calcareous matter in a very short time.

The invention of Mr. Weissenborn proves to be an effectual preventive of incrustation. The water is partially warmed before entering the boiler, and then submitted to certain chemical and mechanical actions, which cause the lime to separate. We have seen specimens of the lime taken from the separator used at Brooklyn. The quantity which is extracted from the water is surprising; and the boiler is kept perfectly clean by its use. The apparatus and process are both simple and economical. It is applicable to steamboats running on the Mississippi and other Western rivers.

## Improvement in Carriage Springs.

We lately had the pleasure of riding in a vehicle fitted with the patent suspension springs of Thomas Murgatroyd, Jr., Smithville, Canada West. The improvement strikes us as a real triumph of ingenuity. The springs are so made as to require less metal in their construction than ordinary springs; they impart an ease and agreeability of motion to the body unknown to ordinary elliptical spring carriages; indeed, the latter seem rough in their action compared with this improvement.

Externally, Mr. Murgatroyd's springs are light and elegant; the mode of fastening is peculiar, such, we should think, as would ensure greater durability than most vehicles possess.

## Mechanic's Fair.

On another page will be found the advertisement of the Massachusetts Charitable Mechanic Association, relating to its next and Eighth Annual Exhibition of American Manufactures and the mechanic arts, to be held in Faneuil and Quincy Halls, Boston, on the 10th, and to continue to the 27th of September next. This Association has done a great deal of good; its exhibitions have been managed with ability, and they have always been an honor to the mechanics of old Massachusetts.

The Eighth Annual Fair of the Chicago (Ill.) Institute will be held in that city from the 7th to the 15th of October next. This fair, for the display of implements and all kinds of machinery connected with and relating to agriculture, will be particularly inviting to Western farmers.

## How to Feed Bituminous Coal.

Where there are two furnaces to a boiler, fire alternately, at regular intervals of time. In throwing on fresh coals, spread them evenly over the bars, commencing at the bridge end. Large coals should be broken into pieces not bigger than a man's fist. Never allow any part of the grate surface to be uncovered, nor allow the fire to burn too low. There should not be less than four inches thickness of bright fuel on the bars when a fresh charge it put on. Keep the bars free from clinkers.

## The Camels have Arrived.

The Arabian camels for which a government expedition was sent out to the Mediterranean arrived in the Bay of Matagorda, Texas, on the 12th ult. Arab keepers accompany them. They came on shore dressed in their native costume, and were as much objects of curiosity as the camels. An attempt is to be made to acclimate these animals, to employ them as transports on the western deserts of our country, between the Mississippi valley and the Rocky Mountains.

## Cents, not Pence.

A number of large firms in the flour trade, in this city, have just commenced to reckon exclusively in the decimal currency, and abolished the shilling and pence business. This was done by a united agreement. It is a strange thing, showing the hold which custom has upon business, that our centesimal currency should be so long in completely overthrowing the old pence and shilling currency.

Senator James, of Rhode Island is, I learn to file a caveat with the Commissioner preparatory to taking out a patent for the manufacture of laws, to enable the lobby to get all they want and more than they ever asked for. —[Correspondence of the N. Y. Herald.]



## Scientific American.

NEW-YORK, JUNE 7, 1856.

## James Patent Bill.

On another column we publish a keen and able review from the New York Herald, of the new Patent Bill. The author of that article gives evidence of having studied the Bill carefully; he sketches its grizzly features and fills in its dark shades with a skillful hand. In no exaggerated language, we think, he depicts the enormous evils that would result from its passage. It would raise the Patent Office into a huge centralizing institution for squeezing the money out of inventors, and for obtaining huge bonuses from monopolizing combinations.

The members of the Press who have read this Bill, and all sound thinking men with whom we have conversed, and who have written to us on the subject, look upon it as an outrage on the good sense of our people, and as being opposed to the spirit of our institutions. Laws made in harmony with the spirit of the people for whom they are intended, cannot fail to be respected. Such would not be the case with the new Patent Bill were it to pass. It would operate injuriously on the progress of improvement, because it provides for raising the Patent Office into an expensive aristocratic institution, to be sustained by enormous and unnecessary exactions. Instead of encouraging inventors to invent and improve, which should be the object and aim of all patent laws, it appears to be imbued with a spirit of opposition to their interests, and consequently, that of the public welfare.

It is universally scouted and derided by inventors and all interested in patents and improvements in the arts. No Bill ever introduced into a legislative body has received such a unanimous public condemnation. We are confident it never can pass, for it scarcely contains one feature worthy of commending it to the favorable consideration of Congress or the people.

## Sickles' Cut-off Patent Expired, and an Extension Refused.

On the 20th of May, 1842 a patent was granted to F. E. Sickles, of New York, for improvements in the manner of constructing the apparatus for lifting, tripping, and regulating the closing of the valves of steam engines. This improvement was known among engineers by the name of "Sickles' cut-off," and the "drop valve cut-off." It covered a pair of springs lying on either side of a horizontal arm attached to the lifter, which, at certain points of the movements, are brought in contact with adjustable studs upon a standard, whereby the valve stem is liberated, and the puppet valve dropped in its seat. The force of the fall of the valve is broken by means of a plunger attached to its stem, and moving within a dash pot containing water, oil, or other fluid, having a supplemental adjustable bottom.

The original application by Sickles for a patent on this improvement was rejected upon the ground that the invention claimed was in use on the steamboat *South America*, and others running in and about the harbor of New York. After this, however, an affidavit made by Trueman Cook was filed in the Patent Office, wherein it was stated that the invention claimed was placed on the engine of the above named steamer after an anonymous letter describing it had been sent to J. Cunningham, the builder of her engine, which letter had been written to him by Sickles, who, however did not sign his name to it. This affidavit caused the examiner who had previously refused to grant the patent to reverse his decision. This is the way the patent for Sickles' cut-off came to be granted; and since it has been in existence it has led to quite a number of expensive law suits, in which the most eminent counsel have been employed. Great issues were involved in the legality or illegality of this patent, because nearly all the river steamboats running to and from New York city, we understand, use the improve-

ment claimed. On the 20th ult. the term of this patent expired, and on that day an application previously filed for its further extension for seven years was refused by the Commissioner. It is now public property; and it seems by the decision that it should always have been so, as the extension was refused on the ground that when the patent was granted the improvement claimed was not new, and the patentee was not the original inventor. A number of suits for infringement had been instituted by the owners of this patent against persons using the steam engines manufactured at Providence, R. I., by Messrs Corliss & Nightingale; we presume this decision will set all these free.

By the patent act of May, 1848, each application for extension is referred to the Chief Examiner having charge of the class of inventions to which the case belongs. The examiner is bound to make "a full report to the Commissioner whether the invention secured in the patent was new and patentable when granted, and thereupon the Commissioner shall grant or refuse the extension." The Commissioner bases his decision on the report of the Examiner, and upon evidence furnished under oath relating to the efforts made by the patentee to introduce his invention, and the amount of compensation received by him, according to its value.

The testimony presented for and against this extension was very voluminous. Regarding it, the Examiner says, in his decision: "From the full reading of the testimony, it appears that Mr. Sickles is not the original and first inventor of the drop valve cut-off and dash pot, as covered by the claims allowed him in the patent which is the subject of application for this extension."

We will now state clearly why the Examiner came to this conclusion. We have already stated the patent was granted (after a refusal) upon the affidavit of Trueman Cook, setting forth that the improvement claimed was put on the engine of the steamboat *South America* after Mr. Sickles had sent an anonymous letter to James Cunningham, which affidavit, instead of leading him to be more suspicious of something wrong, led the Examiner to infer that Mr. Sickles had suggested the improvement to the builder of the *South America's* engine. But it is stated in the recent decision on the extension, that so far from the above-named steamboat having the improvement put on her engine subsequent to the sending of the anonymous letter referred to this steamboat entered upon her regular trips on the 15th of April, 1841, with the drop valve cut-off on, and in fair working order, while the anonymous letter bears the date of the succeeding month, May 4th, 1841.

This anonymous letter is one of the most ridiculous things possible to imagine. If Mr. Sickles was afraid of his invention being stolen, why did he send the letter at all? And if he was the inventor of it, why did he not sign his name to the letter. There is something so inexplicable connected with this anonymous letter, that we cannot but look upon it as an immensely foolish and absurd production; and yet it was the means of bamboozling an Examiner of the Patent Office.

The drop valve cut-off was in public use nearly a year before Mr. Sickles filed his caveat on the 11th of Jan. 1842.

By this decision it appears that an illegal patent has been in existence for fourteen years, engendering law suits, costing litigants thousands of dollars of expense, worrying manufacturers and users of steam engines, thereby operating to check improvements and business; and all for want of a simple amendment which we have often recommended to our patent laws, viz., a writ of *scire facias* to try the legality of a patent.

## The New Patent Law.

We continue to receive from all quarters letters and newspapers remonstrating against the proposed change in our patent system. Nearly every editor who discusses the subject takes strong ground against the Bill; while inventors, patentees, and all whose attention is called to the matter are opposed to its adoption, and indignant at its very suggestion. In other parts of our paper we publish as many

extracts from contemporaries and correspondents as our limited space permits.

## Notes on Ancient and Curious Inventions.—No. 8

*Preservation of Timber.*—Although we have presented and will yet present some curious matter in these articles relating to certain things for which patents have been obtained, our main object is the dissemination of useful information. The preservation of timber has long occupied a prominent place in every department of art, because timber is the most common material that is employed in the arts. It is used in the stately temple and the humble chapel; in the splendid palace and the lowly cabin; in the noble ship and the rude canoe, and for ten thousand other purposes. There is a great variety of timber, differing in strength and endurance, but all kinds are subject to rapid decay when placed in certain situations, and exposed to certain influences.

In such expensive structures as ships alone, millions of dollars have been lost by the dry rot. The cost to our railroads annually, by rot in rail sleepers simply, amounts to hundreds of thousands of dollars. Rot in the sills of timber bridges and houses, taking the length and breadth of our country into account, involves an incalculable amount of loss annually. It is no wonder that so many inventors and men of science have devoted so much time, and made so many experiments to discover a remedy for the evil; the wonder is, that more experiments have not been made. Some processes which have been tried to preserve timber we will now describe.

On June 14th, 1837, A. Gotthilff, of New York, obtained a patent for protecting timber from dry rot. The tar of gas works and pitch, in equal quantities, were placed in metal troughs, and heated up to 400° Fah., and the timber was immersed in this until all its pores were filled. A quantity of salt was also added to the mixture. It is our opinion that this is a very good method of treating timber to be laid on the ground; but for spiles to be used for docks, subject to the attacks of the sea worm, some corrosive sublimate should be added to the tar.

It is rather remarkable that a patent was granted to the same gentleman for the same invention on the 21st of September following the above, as the attorney for J. Knowles and Robert Gilbert, of England.

On April 12th, 1833, C. Morgan, of Louisiana, obtained a patent for preserving wood by saturating it with lime. The timber to be treated was steeped in tanks of lime water for some months, until all its pores were filled with a carbonate of lime. The liquor was renewed in strength from time to time, by adding fresh lime.

On January 16th, 1834, F. Kenshaw, of Brookville, Mass., secured a patent for preserving shingles from decay, by dipping them in scalding hot turpentine and tar, then sifting hot sand upon them.

A wash of lime, wood ashes, salt, and molasses, applied to shingle roofs, in three successive coats, is said to preserve them better than oil paint.

On June 6th, 1846, Peter Van Schmidt, of Washington, D. C., was granted a patent for charring the surface of timber impregnated with any salt, by immersing the wood in hot oil. The impregnating of the timber with a salt, such as corrosive sublimate, or any other preservative, was done in the same vessel in which the timber was charred by the hot oil. It is well known that timber slightly charred will endure for a long time when set in the ground, hence it has been a common practice in some places to char the feet of fence posts. Whale oil boils at 630° Fah.—a heat sufficient to char wood.

It appears to us that some good and cheap process for impregnating timber with certain preservative salts ought to be successful, and come into very general use. Yet although so many patents have been taken out, and although many establishments have been erected for preserving timber, no plan has come into general use among us. A factory established to preserve timber, at Williamsburgh, N. Y., some years since, was soon given up; and another erected at Rochester, N. Y.,

was burned down about three years ago, since which time we have not heard any more regarding it.

The same subject, describing other processes, will be continued next week.

## Recent American Patents.

*Machine for Cutting Barrel Heads.*—By N. W. Robinson, Keeseville, N. Y.—In relation to this invention, noticed in No. 36, the inventor desires us to say, that the heads are cut and finished without turning or touching the stuff, after it has been once placed in the machine. An engraving will appear in our columns in a few weeks.

*Spheriotype.*—This is the name given by the inventors, A. Bisbee, of Columbus, Ohio, and Y. Day, of Nashville, Tenn., for an improvement in ambrotypes pictures (photographs on glass.) The edges of the glass are left transparent, and the *mat* is placed behind the picture, not on a level with it, which is the common way. The effect of this improvement is to make the picture stand out in relief something like the solid appearing picture of the stereoscope.

*Manufacturing Cast Steel.*—The improvement for which the patent is granted this week to F. Uchatius, of Vienna, Austria, is of a peculiar character. Pig iron of the best quality is first melted in a suitable furnace, and while it is in a molten condition it is poured into cold water, thereby reducing it to a granulated state. It is then ready to undergo the process which will convert it into steel. This process is founded on the theory that cast iron surrounded by any oxygenized materials, and subjected to a tempering heat for a given time, will yield up a portion of its carbon, which will combine with the oxygen of the surrounding materials, and pass off as carbonic acid gas, and thus convert the pig iron into cast steel. By granulating the iron, an immense amount of surface is brought into contact with the oxidizing materials, and thus the process is greatly facilitated. The granulated iron is mixed with 20 per cent. of roasted pulverized sparry ore, and 4 per cent. of fire clay placed in crucibles, and subjected to heat in a blast steel furnace. By thus subjecting the granulated iron in presence of the sparry iron ore to a melting heat, the enveloping oxyds effect the desired decarbonization of the pig iron. The novelty of the invention consists in the conversion of pig iron into steel at one melting, by granulating the iron and treating it as has been described.

*Machine for Molding Hollow Brick.*—By Messrs. Buck and Cushman, of Lebanon, N. H.—The invention for which a patent was granted to the above parties last week, will be found fully illustrated and described in No. 34, present volume of our paper.

*Improved Grain and Grass Harvesters.*—By James T. Youart, of Troy, Ohio.—In this improvement the cutter consists of a straight-edged continuous knife. Above the knife there is arranged a series of movable V-shaped plates, called by the inventor "collectors." These serve to catch the grain or grass, and pull it in against the knife, as the machine advances. Another feature of the invention consists in a method of preventing the side draft.

*Governor for Marine Steam Engines.*—By Wm. B. Godfrey, of Auburn, Iowa.—This governor consists of a wheel with small paddles fitted to the paddle wheel shaft of the ordinary steamers. The small paddles are so controlled by springs and connected with the throttle valve or cut-off gear, that when the propelling paddle wheel is out of the water, the governor wheel will be held by the springs in such a position as to close the throttle valve or cut-off. But when the propelling paddles are submerged, the paddles of the governor wheel will be so acted upon by the resistance of the water, as to give the throttle valve or cut-off the requisite opening.

*Preserve or Fruit Can.*—By Wm. J. Stevenson, of New York City.—This invention consists in an improvement for the purpose of effecting the hermetical sealing of the can by the action of atmospheric pressure on the cap or stopper. Inside the mouth of the vessel there is a shoulder on which is placed a ring of rubber. The cover is simply



flat disk of tin, with cross wires soldered on its top, so as to guide and keep it in the center. When the preserved fruit or other article has been sufficiently heated, the cover is laid on, and the subsequent cooling produces a partial vacuum within the vessel. The consequent atmospheric pressure on the disk imbeds it into the rubber, and thus forms a perfectly air-tight joint, without screw or wax.

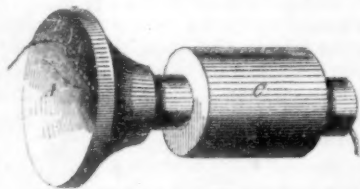
**Self-Acting Head Block for Saw Mills.**—By Lucius B. Adams, of Smithfield, Ulster P. O., Pa.—Consists in operating the sliding head to which the dogs are attached, by means of a lever passing over inclined planes attached to the flooring. Said lever is connected to another lever having a pawl secured to it, which pawl acts upon a ratchet, and turns a pinion. The latter gears into a rack, and moves the sliding head to which the log is secured at the proper moment.

**Governor for Marine Steam Engines.**—By W. W. H. Mead, of Chestertown, N. Y.—This invention consists in a novel mode of combining a centrifugal governor or fly, with a throttle valve or cut-off, whereby the moment of inertia of the said governor or fly will act upon the valve in such a way that any tendency towards increased speed of the engine will cause the supply of them to be diminished, and vice versa. This invention may be applied either to marine or stationary engines but is particularly designed for marine engines.

**Improvement in Slide Valves.**—By John F. Allen, of New York City.—This invention consists in a movable valve seat arranged to operate as between the face of the slide valve and the usual stationary seat. Its object is to obtain a free exhaust of steam until the termination of the stroke of the piston or till the lead of the valve for the induction of steam commences. The resistance which is caused by what is known to engineers as the cushioning of the steam, in the cylinders, is thus obviated. The invention is applicable with especial advantage when a lap valve is employed as with that kind of valve the exhaust port is generally entirely closed some time before the stroke of the piston commences.

**Improvement in Roving Tubes.**—By Moses Sargent, Lake Village, N. H.—The roving tube is that portion of the machine used in manufacturing cloth and other fabrics, by which the loose roving or sliver receives its first twist. It is simply a flaring mouthed pipe, to which rapid revolution is given while the sliver passes through its center; a bail extends across the mouth of the tube, which causes the sliver to twist. The bail is objectionable, because it is apt to press against the sliver and rub off the waste, which catches on some other part, and causes bad work; again, the bail is apt to break the roving, and when broken, the machine must be stopped.

The present improvement consists of the employment of a hook instead of a bail. In the cut, A is the flaring mouth of the tube, B



the hook, and C belt pulley on the tube, by which motion is communicated.

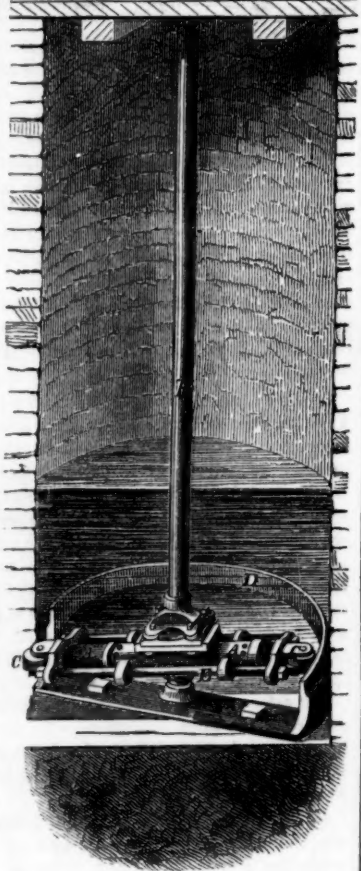
The use of the hook obviates the objections named, permits the mending of the roving in case of breakage, without stopping the machinery, or even a single tube, and thus saves much time. The hook is also very cheap, easily applied, does not get out of order, &c.

The invention has been extensively tested in several mills, and is said to work admirably. Address the inventor for further information.

**Improved Capstan.**—By Samuel Gaty, of St. Louis, Mo.—Consists in attaching the body of the capstan to the head, in two different ways one being a direct connection, and the other an indirect connection, by means of gearing. The parts are so arranged that when the head is turned in one direction, the body will turn with equal speed; but when the head is turned in the opposite direction, the speed of the body will be considerably slower than that

of the head, but the power will be greatly increased. This is a capital improvement.

**New Rotary Pump.**—Mr. Hosea Lindsey, of Asheville, N. C., is the inventor of a new lift and force pump which presents several novel and useful features; herewith we present an engraving of the invention.



The pump barrel, A, is placed horizontally at the bottom of the well, and is made to revolve by means of hollow shaft, B. Each end of the pump barrel is furnished with a piston, the outer extremity of whose rods are provided with friction wheels, C. As the pump barrel revolves, these wheels, C, come in contact with the cam-shaped half circle, D, and the pistons are thus alternately moved in and out; the pistons are connected together by rods, E, so that when one is pushed in the other goes out.

The action of the pistons forces the water up the hollow shaft, B, and it escapes through the crank, F, one end of which is hollow for that purpose. Motion is given by turning the handle, G. The circular basin, H, is large enough in diameter to receive the water from F, as it turns around.

Water may be raised to an indefinite height by the use of this pump, at a comparatively small expense. The common force pump must be placed within thirty feet of the water, and in addition to the induction and eduction pipes and air chamber, requires to have a piston rod, extending from the top of the well down to the piston. In the present improvement no such air chamber or rod is required; the hollow shaft, B, serves the double purpose of communicating motion and conducting the water.

This pump is very simple in construction, not liable to get out of order, durable, easily operated, economical for manufacture. We regard it as an excellent improvement. Jas. M. Edney, 56 John street, is the agent for the sale of these pumps for all parts of the world, and the exclusive agent for New York. Circulars, with full description and prices, sent

free of charge on application. They are for sale also by the inventor, Asheville, N. C. Patented Dec. 4, 1855.

**Purification of Gutta Percha.**—By James Reynolds, of New York City.—Gutta percha, in the raw state in which it is imported, contains large quantities of bark, dirt, and foreign substances. In the common processes of manufacture these cannot be extracted, and bad results often ensue. For example, in the covering of telegraph wires, holes are often left wherever foreign substances are present, and thus the insulation is impaired. The only method heretofore employed, for preventing the quality of the manufactured article from being too much injured by the presence of these impurities, has been to reduce the bark and dirt into fine particles, by long-continued and tedious grinding, and then incorporating them with the gum.

The object of the present improvement is to effect the entire extraction of the bark and other foreign particles, and thus improve to a very great degree the quality of the manufactured article. The invention consists in first cutting the gutta percha into extremely thin slices or sheets, and then submitting it to heating, rubbing, and screening operations. Under this treatment the foreign matters are almost entirely extracted, and the gutta percha left pure. This is a valuable invention.

**Improved Cotton Gin.**—By W. B. Lindsay, of New Orleans, La.—Consists in the employment of a reciprocating card, and two vibrating stripping cards, in combination with breasts. The invention has been practically tested and operates well. Long as well as short staple cotton may be perfectly ginned by it. It operates rapidly, and is peculiarly adapted for ginning Sea Island cotton.

**Improved Corn Sheller.**—By C. S. C. Crane, (assigned to S. M. Tinkham of Taunton, Massachusetts).—Consists in the employment of a shelling wheel, toothed or corrugated on both sides, two elastic pressure bars and stops, and a feeding device, so arranged and operated that the bars are fed in by a hopper, but cannot clog up the machine. It is a very good improvement.

**Improved Printing Telegraph.**—By David E. Hughes, of Louisville, Ky.—This invention has already become quite celebrated, owing to the numerous reports respecting its marvellous capabilities that have been circulated in the public papers for more than a year past. The patent, which has been reported as pending for a long time, has just been granted. The inventor's claims were published last week.

As a specimen of the notices, which this improvement has enjoyed, we copy the following from a late number of the *New York Tribune*.

"[1.] This invention may be called a printing press and telegraph instrument combined, for it prints all messages in plain Roman capitals, with unerring correctness, and at an almost incredible rate of speed, averaging, in the ordinary dispatch of business, from 20,000 to 25,000 letters per hour. [2.] The Hughes instrument clearly demonstrates the practicability of sending and receiving messages in opposite directions over the same wire at the same instant of time, and with the utmost ease, regularity, and certainty. It will consequently require but one wire and one operator, at any given point, to send and receive as much business as can be transmitted by the aid of four or five operators and an equal number of wires under the Morse system. [3.] Another equally important peculiarity connected with the Hughes invention, is the undoubted fact that it will work perfectly in very long circuits, and with unerring accuracy in all states of the atmosphere—neither mist, rain, nor snow having any perceptible effect. Therefore, at seasons when the Morse and House instruments are utterly powerless, even in circuits of fifty miles, there is every reason to believe that the Hughes instrument will work reliably in circuits of 1,000 or 2,000 miles. The simplicity and durability of the new machine will compare favorably with the Morse, and is vastly superior in these respects to the House instrument. The governing principle of this invention is wholly dissimilar to that of the Morse, House, and all other telegraph instruments, and consequently, there

can be no difficulty on the score of the patent, which, we understand, has been sold for about \$125,000 or \$150,000 to the American Telegraph Company, a new Association having its headquarters in this city, but composed of gentlemen of the highest respectability residing in different sections of the United States and the British North American Provinces, and of which it is sufficient to say that Peter Cooper is the President, and Wilson G. Hunt Treasurer."

[By Telegraph to the Tribune.]

WASHINGTON, May 20, 1856.

Letters patent were issued to-day from the Patent Office to David E. Hughes, covering all his claims for his new Printing Telegraph Machine. [4.] More than ordinary care has been bestowed by the Commissioner and his assistants of the Patent Office in their examination of the claims of Mr. Hughes, to guard against the possibility of conflict with prior patents to Morse, House, and others, and we are assured, on the very best authority, that the rumors set afloat by interested parties, to the effect that the Hughes machine infringes upon the rights of other patentees, are wholly destitute of foundation.

[1.] Alexander Bain exhibited, in operation in this city, eight years ago, a telegraphic instrument capable of sending from 25,000 to 50,000 letters per hour. The message was first prepared by slotting the telegraph paper. It could then be run through the machine by clock-work, without being touched by the attendant. This method possessed no advantage except that several persons could be employed in preparing parts of the message, and thus its delivery would be hastened. But the expense, owing to increased labor, was augmented, and so the plan is not now used. It may be very easily applied to the Morse, the House, or the Bain Telegraphs.

The common method of telegraphing is by touching a key or keys, with the finger, and the ordinary speed is 100 letters per minute, or 6000 per hour. This is about as fast as a good penman can write. We are told that some of the Morse operators have been known to send 250 letters per minute; but this speed was on a wager and could not long be maintained.

The *Tribune* intimates that by Hughes' Telegraph the ordinary dispatch of business will be 20,000 to 25,000 letters per hour. This cannot be done without some such previous preparation of the message as we have indicated. The statement that one person will be enabled to do four or five times as much business as one operator on the Morse telegraph we regard as erroneous. We think that Morse's simple instrument will very nearly, if it does not quite equal, in expedition, the somewhat complicated machine of Mr. Hughes, the conditions being equal. It would be an easy matter to connect a printing apparatus with the Morse Telegraph, but it is not wanted, and is of no advantage.

[2.] Sending two messages, in different directions, over the same wire, is quite old. Mr. Hughes very properly disclaims it as new. It is just as applicable to Morse's telegraph as to Hughes'.

[3.] Will somebody be good enough to tell us how the fact that Hughes' Telegraph will work so much better than Morse and House's, on long circuits, in bad weather, has been established? We are told that Mr. Hughes' instrument has never been tried at all, except on a short circuit. Perhaps our information is wrong.

[4.] It may be that the Commissioner of Patents and his assistants bestowed more than ordinary care upon the claims of Mr. Hughes, but no such care can, by any possibility, prevent infringement, where there is similarity between two inventions. We are assured "on the very best authority," that Hughes' Telegraph is an infringement both on Morse's and House's patents. We trust, however, that such will not prove to be the fact.

Our comments are occasioned not through any hostility to Hughes' Telegraph, or Mr. Hughes, for we have not the pleasure of the gentleman's acquaintance, but simply to correct false impressions that have been industriously circulated for some time past. It is not fair that noble and important inventions like those of Morse and House should be disparaged, and the interests of stockholder injured, in order to boost up a new joint-stock company.



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[illegible]

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## Science and Art.

## Oxygen.

By this name we introduce the reader to the king of the elements, whose power is universal. The sea, the air, and the dry land would cease to exist without it. It is our friendly ally and inveterate foe. We cannot exist without oxygen, yet it is the ultimate cause of death and decay. It is the giver of light and heat, for no combustible material can burn without it. In fact, were it not for oxygen, there would be a universal chaos of matter; there would be no living thing creeping or growing upon the face of the globe; and the sun would shine only upon a metallic spheroid, such as is, probably, the moon and the stars. The air, containing one-fifth of oxygen, is the natural source for obtaining it; but to separate it by any direct process, to sift it out, as it were, is a problem as yet to be solved by chemical genius. When we want oxygen for experiments we separate it from some material that has already drawn it from the atmosphere, such as the oxyd of mercury or manganese. The novice may also obtain oxygen from chlorate of potass. It is a very simple experiment. Mix a little chlorate of potass with a equal weight of washed silver sand; put the mixture into a clean oil flask, and set it over a clear fire. The chlorate will soon melt, and then boil; every bubble is a bladder of oxygen gas, which now invisibly fills the flask. To prove its presence, take half an inch of the sulphur end of a match, stick it on the end of a piece of fine wire, light the match, and then quickly pass it into the interior of your oxygen chamber; you will then see the intense vivifying effects of the king of the elements; and if you are expert, the wire will take fire when the last of the match is consumed. All the rest you will learn without a book.

SEPTIMUS PIESSE.

## Plaster of Paris.

In its natural state this is a salt of lime known by the name of gypsum, and is largely diffused throughout the world. Its constituent parts are lime and sulphuric acid. When calcined it is converted into plaster of paris. In fine powder, when mixed with water, it becomes heated, and will harden to a solid mass; it is, therefore, much used for potter's molds, images, and medallions. Its combining proportion of water is 27 per cent., and it is its property of suddenly hardening when mixed with water, which makes it so valuable for casting. It is a good non-conductor, hence it makes a good plaster for the interior of buildings, and for the filling of fire-proof safes. It is applied in large quantities to meadow and grass lands in a state of powder. The gypsum is simply ground up in mills, and sold to the farmers in this state. Placed in sinks it absorbs ammoniacal vapors, and is thus a deodorizer; therefore it is very useful in many places in cities during hot weather, thus to apply it. Common slacked lime is cheaper and much used for this purpose, but it is not so good.

## Oil from Coal.

Messrs. Cairns, of Cloverport, Ky., inform us that they have commenced to manufacture oil on a large scale from the Breckenridge coal. They have erected twelve retorts, from which they have been running off a great quantity of very rich crude oil, and they were to commence this week to purify it. It is very evident that the earth was prepared with the special end in view of being man's abode, and the Great Architect of it has laid up stores in the bowels of the earth, from which man is to be supplied with light and heat, when our forests shall fail, and the whale cease to be chased by the daring mariners of Nantucket.

## Domestic Ginger Beer.

Two gallons of ginger beer may be made as follows:—Put two gallons of cold water into a pot upon the fire; add to it two ounces of good ginger, and two pounds of white or brown sugar. Let all this come to the boil, and continue boiling for half an hour. Then skim the liquor, and pour it into a jar or tub, along with one sliced lemon, and half an ounce

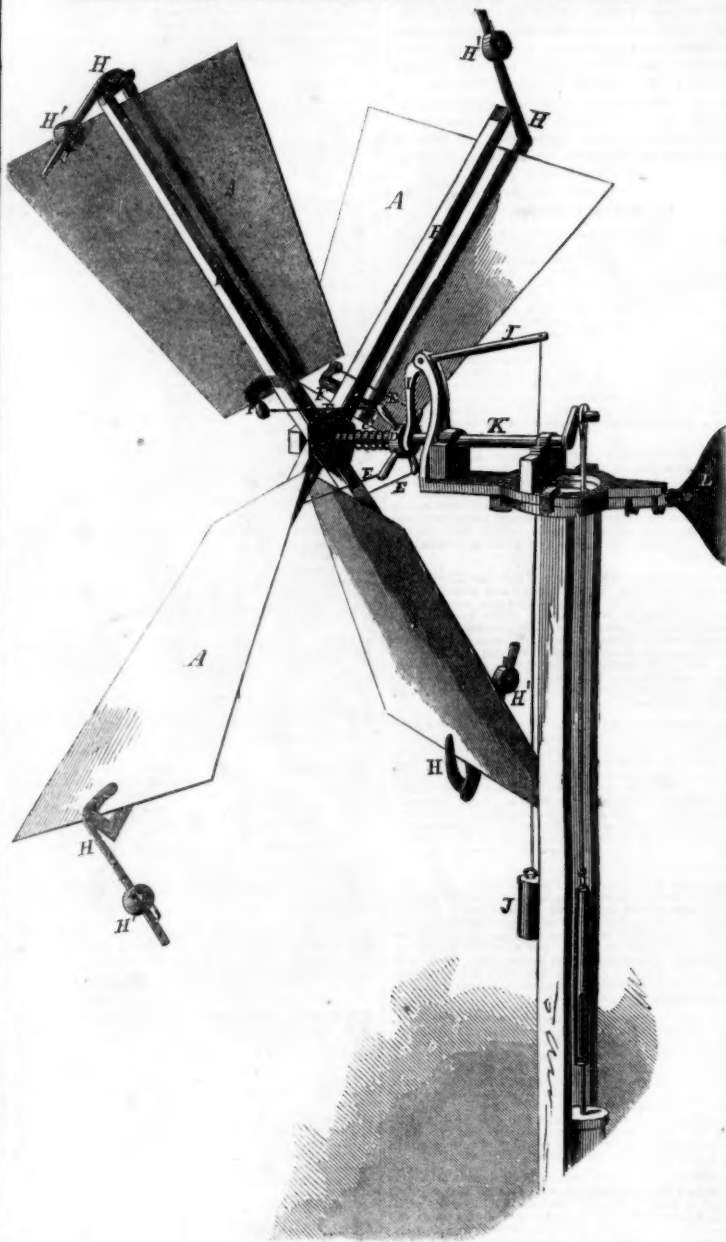
of cream of tartar. When nearly cold, put in a teacupful of yeast, to cause the liquor to work. The beer is now made; and after it has worked for two days, strain it and bottle it for use. Tie the corks down firmly.

## Internal Improvement in Egypt.

Of the capital stock of the Suez canal, forty-five millions of francs worth was reserved to be subscribed in Egypt, and of that the viceroy took fifteen millions. The remainder

was entirely subscribed in three days by the public, and one million nine hundred thousand of the amount was taken by fifty native Egyptians of the ancient race—being the first known instance of the participation of that people in an industrial enterprise of a national or corporate character. A new light is certainly breaking in upon ancient Egypt, the mother of the arts. Who knows, but it may yet arise to more than its ancient greatness?

## IMPROVED SELF-REGULATING WINDMILL.



## Improvement in Windmills.

In this improvement the wings, A, are hinged to arms, B. The wings are constantly held in position by means of spring, C, with which they are connected through nut D, rods E, and studs F.

The regulation of the position of the sails is effected by the hook-shaped weighted levers, H, which are pivoted on the outer ends of the arms, B, in the manner shown. When the speed of the sails increases beyond a certain gauge, the weighted ends of the levers being placed in advance or ahead of the sails, fly out, like the balls of a governor, and cause the inner or hook part of the levers to press on the wings, A, and open them so that they will offer much less resistance to the wind; thus the speed is instantly diminished. The weights, H', slide on the levers, being fastened in a given position by a thumb screw or wedge.

I is a crooked pivoted lever, one end of which terminates behind the nut, D; a cord is attached at the other end, and supports weight J, which is hung on whenever it is desired to stop the machine. The weight acts through lever I, and presses nut D up against spring C, thus operating on the wings and causing them to open so as to present only their edges to the wind. K is the main shaft, terminating in a crank, which is represented

in our cut as attached to a pump. L is the vane.

We are informed that large windmills, constructed on the plan here shown, operate with an extremely uniform velocity, no matter how hard, or how irregular and squally the wind may blow. The regulation is perfect, entirely self-acting, requires no attention, and cannot well get out of order. The parts are simple, and the original expense of manufacture is comparatively small.

This windmill is an alleged improvement over the one patented by Mr. Lempecke on the 8th May, 1855, and illustrated in No. 2 present volume SCIENTIFIC AMERICAN.

Mr. A. Lempecke, of Pleasant Mount, Wayne Co., Pa., is the inventor, of whom, or of Mr. H. W. Brown, same place, further information may be obtained. Patented March, 1856.

## Improved System in Mill Work.

The adaptation of the oscillating cylinder is becoming more and more general. Two pair of engines, upon the oscillating principle, are now in course of completion, and being erected in the "Metropolitan Flour Mills," of this city. They are built by Henry Waterman, of the "Clinton Foundry." The engines themselves are an excellent piece of mechanism being simple, strong, and well finished. A

few details of them, and their arrangement, may interest our readers.

The usual system followed in the mill work of a flour mill has many evils and annoyances. Gearing of the heaviest description has been applied for obtaining the necessary motion of the stones, but owners complain of the jarring noise, and breakages of the teeth. Any sudden check or sudden impetus is decidedly hurtful to gearing, and in a flour mill it is subject to this. The motion required for the stones is an horizontal and circular one; to obtain this a pair of miter gears have to be used, with an addition of a heavy shaft and a fly wheel. The gears soon get out of truth and become troublesome, and if the teeth happen to break, the whole of the machinery is stopped for repairs.

By means of these oscillating engines, the horizontal motion is at once communicated and discards all complication and gearing. The cylinders are 14 inches diameter, and 3 feet stroke. They are fixed to the beams of the upper story, and stayed by a strong diagonal cast iron framing. The principal novelties about them are their nice arrangement in position, and also the manner in which the valves obtain their motion. Upon the crank pin of the crank which turns the shafts, is another lighter crank, with 18 inch centers, nearly. Upon the crank pin of this second crank, is an eccentric, which drives the main valves of both engines; above this eccentric is a small crank for the cut-off which is adjustable. There is a square brass slide upon the main valve rod, to which the rods of the cut-off are annexed. When in motion, therefore, this cut-off slide moves upon the main valve rod, thus giving an easy, simple, and steady motion.

## Cold Weather.

The past week has been the coldest at this period of the season, which has been experienced for 60 years. On the 30th the snow fell in Pittsburg, Pa., and on the 31st there was frost in New York City.



Inventors, and Manufacturers

ELEVENTH YEAR

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